07-07-03

"PATENT"

1464

AMENDMENT TRANSMITTAL FORM

In re application of: R. Gupta
U. S. Serial No.: 09/712,654 [814201]
Filed: November 14, 2000
For: A METHOD FOR EXTENDING THE OPERATING LIFE OF A FIXED BED REACTOR

) Before the Examiner
) Basia Anna Ridley
)
) Confirmation Number: 4644
)
) Group Art Unit: 1764
) Family Number: P1999J032 - US2

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PATENT & TRADEMARK OFFICE

Commissioner for Patents
P.O. Box 1450
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[X] "Express Mail" mailing label number ET 040096554 US . Date of Deposit July 3, 2003 .
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KAREN K. SIMPSON
(Type or print name of person mailing paper or fee)

Karen K. Simpson
(Signature of person mailing paper or fee)

Transmittal herewith is a Letter in the above-identified application.

Petition for extension of time pursuant to 37 CFR 1.136 and 1.137 is hereby made, if and to the extent, required. The fee for this extension of time is calculated to be $_____ to extend the time for filing this response until _____.

The fee for any changes in number of claims has been calculated as shown below.

CLAIMS AS AMENDED						
(1)	(2) Claims Remaining After Amendment	(3)	(4) Highest Number Previously Paid For	(5) Present Extra	(6) Rate	(7)
Total Claims	*	Minus	**		x 18.00	
Indep. Claims	*	Minus	***		x 84.00	
MULTIPLE DEPENDENT CLAIM FEE					$280.00	
				FEE FOR CLAIM CHANGES		- 00 -

* If the entry in Column 2 is less than the entry in Column 4, write "0" in Column 5.
** If the "Higher Number Previously Paid For" IN THIS SPACE is less than 20, write "20" in this space.
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, write "3" in this space.

The total fee for this Letter, including claim changes and any extension of time is calculated to be $ - 00 - .

[ ] Charge $ - 00 - To Deposit Account No. 05-1330.

[ ] The Commissioner is hereby authorized to charge any additional fees under 37 CFR 1.16 and 1.17 which may be required by this paper, or credit any overpayment, to Deposit Account No. 05-1330. A duplicate copy of this Form is enclosed.

3 July 03
Date of Signature

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[X] Pursuant to 37 CFR 1.34(a)

27810
PATENT TRADEMARK OFFICE

P1999J032 PATENT

#14
7/10/03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of	:	R. Gupta
Serial No.	:	09/712,654
Filed	:	14 November 2000
For	:	A Method for Extending the Operating life of a Fixed Bed Reactor
Group Art Unit:		1764
Examiner	:	Basia Anna Ridley

Letter

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Remarks

1. This is in response to the Office Action (Paper No. 18) of 3 June 2003.

2. In the Action, the Examiner has reiterated the rejection of all the claims in the application on the basis that they are unpatentable over the Beal (U.S. 3,607,000) and Gupta (U.S. 4,313,908) references. The gravamen of the rejection is that the Examiner considers it would have been obvious to modify the reactor/bypass construction of Beal by omitting the rupture disk because an open type bypass is described in Gupta. The reason why the Examiner considers it would have been obvious to the notionally skilled person to make the modification of Beal in view of Gupta's teachings is that the Gupta allows for a low pressure drop and a several fold increase in on-time of the reactor and, at the same time, increases reliability over bypass systems with a rupture disk. It is conceded that Gupta refers to his system of bypass tubes having a low pressure drop but, it is pointed out, Gupta does not attribute the low pressure drop to the absence of a rupture disk but rather, to the fact that he uses tubes of different lengths so as to segregate liquid and gas flow

(column 3, lines 39-46). In addition, the increase in reactor on-time (cycle length) stems from the use of the bypass rather than from any particular feature of the bypass itself such as absence of rupture disks. Also, it should be noted, the increase in reactor on-time referred to by Gupta is with the reactor as a whole because once Gupta's total bypass system becomes operative, the bed is completely bypassed, thus ending the on-time of that bed; total reactor on-time may be increased but only at the expense of individual bed on-time.

3. It is submitted that the Examiner is not justified in asserting that certain advantages would be expected to flow from the absence of rupture disks in a Beal type system simply because Gupta refers to the advantages of low pressure drop and extended reactor on-time. There is no teaching in Gupta which points towards the desirability of eliminating the rupture disks from a Beal type system and no reason why the skilled person would have sought to apply Gupta's teachings to Beal's system. The Examiner's reasoning is therefore based on impermissible hindsight reconstruction.

4. The fundamental flaw in the Examiner's reasoning is this: Gupta's system of bypass tubes is not described as being applicable to the Beal type of bypass system in which the bypass tubes terminate in the catalyst bed nor would the skilled person have expected it to be so applicable. In Gupta's system, *the bypass tubes pass completely through the catalyst bed and therefore, when the bypass becomes operative, result in the catalyst in the bed being bypassed completely.* By contrast, Beal's system, like the present one, is a system which is intended to bypass only a selected portion of the bed when it becomes fouled, so as to admit the treat fluid to a portion of the bed which is still relatively fresh. While a system of completely open tubes of different lengths might be applicable to the total-bypass concept taught by Gupta, there is no reason why the person of ordinary skill would have expected it to be applicable with advantage to the Beal partial bypass concept in which the bypasses terminate inside the catalyst bed. Obviously, if the bypass tubes terminate inside the catalyst bed, as in Beal and the present invention, the pressure drop considerations become entirely different to what they are with the total bypass system of Gupta. With Gupta, when the bed becomes fouled, the bypass tubes

become operative and because they are completely open at their lower ends, impose no significant pressure drop and permit free flow of the treat fluid. When the lower ends of the bypass tubes are immersed in the catalyst bed, the catalyst still imposes a resistance to flow so that the low pressure drop factor is no longer important. For this reason, the pressure drop of Gupta's open total bypass tubes would not have been considered as a factor which would have lead to the adoption of Gupta's open tubes in a Beal type reactor: the skilled person would not have sought to apply Gupta's open-tube, total bypass concept to Beal's partial bypass reactor. Thus, there is a valid technical reason why the Beal and Gupta teachings should not be combined: the skilled person would not have thought of combining them and would not have sought to combine them. The adduced combination of Beal and Gupta is therefore not warranted by the facts.

5. The limitation of the present claims to a partial bypass system in which the treat fluid is diverted into the catalyst bed rather than completely around it, is shown in the claims. Claim 9 reads (note italics):

> 9. A method for operating a fixed bed reactor having an operating life for reacting a feedstock said fixed bed reactor comprising a fixed catalyst bed having a top layer and a bottom layer, wherein during operation of said fixed bed reactor a feedstock flow passes through said fixed catalyst bed and a pressure drop across said top layer of said fixed catalyst bed increases during reaction of said feedstock due to fouling of said top layer of said fixed catalyst bed, the method comprising:
>
> (a) placing a bypass apparatus *within* said fixed catalyst bed in substantial alignment with said feedstock flow through said fixed catalyst bed said bypass apparatus comprising,
>
> a cage member comprising a first elongated hollow member having a top wall, side walls and a bottom wall, said cage member having openings therein, and
>
> a second hollow elongated member for bypassing an increasing amount of said feedstock through said second hollow elongated member into said cage member as said top layer of said fixed bed fouls to create a bypass flow, said second hollow elongated member being disposed within said cage member and protruding through said top wall of said cage member and wherein said second hollow elongated member extends above said fixed catalyst bed through said cage member, said second hollow elongated member being

sized to regulate said bypass flow, said cage member having a substantially larger cross-section than said second hollow elongated member so that said bypass flow exists from said cage member *into said bottom layer of said fixed catalyst bed* at an effectively reduced velocity,

(b) introducing said feedstock into said fixed bed of catalyst material, wherein a majority of said feedstock will flow through said top layer of said fixed bed of catalytic material, and

(c) as said top layer of said fixed bed of catalytic material fouls, bypassing said increasing amount of said feedstock *to said bottom layer of said fixed bed of catalytic material* thereby extending the operating life of said fixed bed reactor; wherein said second hollow elongated member is continuously open to said bypass flow.

Similarly, claim 12 reads:

12. A method for extending an operating life of a fixed catalyst bed reactor, the method comprising:

providing a reactor comprising at least one fixed catalyst bed ;

establishing a feedstock flow through said at least one fixed catalyst bed partitioning said at lease one fixed catalyst bed in to a top layer and a bottom layer by placing a bypass apparatus within said at least one fixed catalyst bed in substantial alignment with said flow of said feedstock, said bypass apparatus comprising,

a cage member comprising a first elongated hollow member having a top wall, side walls and a bottom wall, said cage member having openings therein, and

a second hollow elongated member for bypassing an increasing amount of said feedstock through said second hollow elongated member into said cage member as said top layer of said at least one catalyst fixed bed fouls to create a bypass flow, said second hollow elongated member being disposed within said cage member and protruding through said top wall of said cage member and wherein said second hollow elongated member extends above said at least one fixed catalyst bed through said cage member, said second hollow elongated member being sized to regulate said bypass flow of said feedstock into said cage member, said cage member having a substantially larger cross-section than said second hollow elongated member *so that said bypass flow exits from said cage member into said bottom layer of said at least one fixed catalyst bed* at an effectively reduced velocity,

bypassing said increasing amount of said feedstock flow through said bypass apparatus *to the bottom layer*, as said top layer fouls;

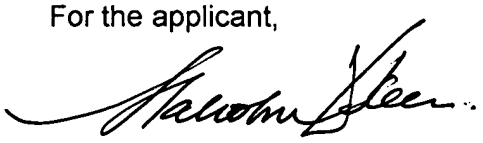
wherein said second hollow elongated member is continuously opened to said bypass flow.

5. From this it is clear that the present claims are directed to a partial by-pass system in which, as the top of the catalyst bed becomes fouled, the fluid flow is diverted into the lower part of the bed where the catalytic reaction can be continued to extend bed life substantially. This advantage is not possessed by Gupta's total bypass system in which the bed is completely bypassed when fouling occurs. In other words, bed life ends when Gupta's total bypass becomes operative (Gupta might rightly be thought of as not concerned with extending bed life but rather, with terminating it); in the present system, by contrast, bed life is extended further by having the flow go into the bed rather than around it. Thus, the present invention is an improvement both upon Beal and upon Gupta. Because of the rather different characters of the complete (Gupta) and partial (Beal) bypass reactors, the skilled person would not have seen the expedients of one system being applicable to the other. In particular, the different pressure drop characteristics of Beal's partial bypass reactor configuration would not have commended the adoption of the open bypass tube system of Gupta, regardless of what advantages it possessed in Gupta's total bypass system.

6. In view of the above, Applicant submits that the rejection based as it is upon Beal and Gupta is not warranted by the facts and should be withdrawn as not based upon substantial evidence. Reconsideration is therefore requested.

For the applicant,

Date: July 3, 2003



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